Compressed Air System Assessment: Preliminary Findings Synopsis

By: Compressor Energy Services

For: Nichols Portland, LLC

March 2021

NICHOLS PORTLAND

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Existing Equipment

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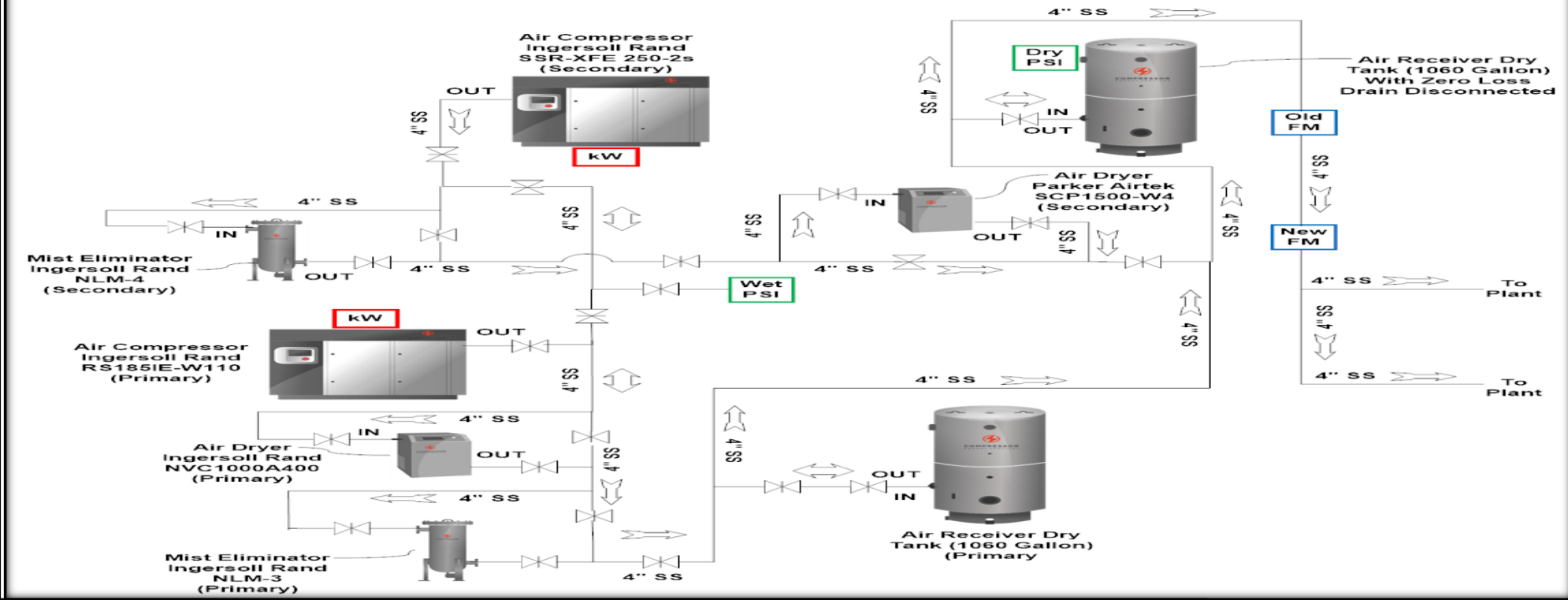
Nichols Machine - Portland, ME

*** All equipment has zero loss drains unless noted. ***



#	Status	HP	Manufacturer	Model	Control Type	Lubricated	Stages	Cooling Method	Type	Pressure Rating	Year	Compressor Hour Meter (Running)	Set-point(s) PSIG	Deploy kW Meter	Package Input kW	CFM Capacity	Measured Avg kW
1	Lead	250	Ingersoll Rand	RS185IE-A110	Load/No Load	Oil Flooded	Two-Stage	Air Cooled	Rotary Screw	110			107	Yes	223	1444	216.22
2	Backup	275	Ingersoll Rand	SSE XFE250-2S	Load/No Load	Oil Flooded	Two-Stage	Air Cooled	Rotary Screw	110				Yes	217	1380	0.76

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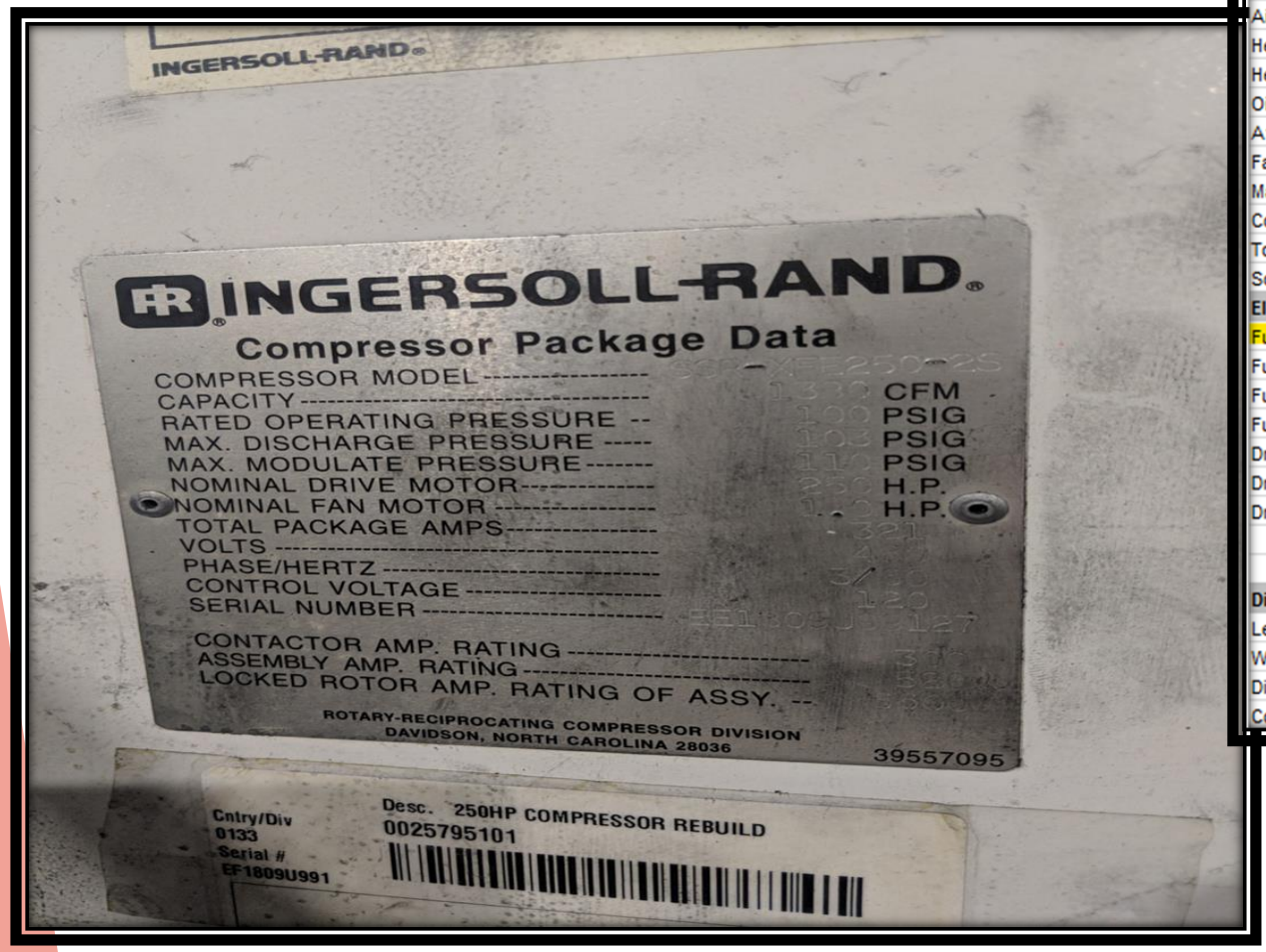
CAGI Sheet (SSR-XFE250-2S)



Ingersoll-Rand SSR		2 Stage XFE200	2 Stage EPE200	2 Stage HPE200	2 Stage XFE250	2 Stage EPE250	2 Stage HPE250	2 Stage XFE300	2 Stage EPE300	2 Stage HPE300
General Data										
Capacity FAD	CFM	1,100	990	924	1,380	1,249	1,167	1,685	1,476	1,428
Compressor Power	HP	220	220	220	275	275	275	330	330	330
Nominal Operating Pressure	PSIG	100	125	140	100	125	140	100	125	140
Maximum Operating Pressure	PSIG	110	135	150	110	135	150	110	135	150
Minimum Operating Pressure	PSIG	65	65	65	65	65	65	65	65	65
Rotor Diameter	mm	226/182	226/182	226/182	297/250	297/250	297/250	297/250	297/250	297/250
Male Rotor Speed 1st Stage	RPM	2864	2638	2533	1525	1380	1290	1860	1630	1576
Male Rotor Speed 2nd Stage	RPM	2724	2515	2418	1322	1203	1128	1593	1406	1363
Cooling Data										
115 F Maximum Ambient										
Operating Temperature	F	215	213	211	207	203	200	209	205	201
Airend Injection Temperature	F	181	181	181	160	160	160	160	160	160
Heat Removal - Oil Cooler	1000 BTU/Hr	476	476	476	595	595	595	714	714	714
Heat Removal - Aftercooler	1000 BTU/Hr	131	125	116	175	150	135	217	182	166
Oil Flow	GPM	57	61	65	68	79	83	68	79	83
Aftercooler CTD	F	15	15	15	15	15	15	15	15	15
Fan Air Flow	CFM	15,000	15,000	15,000	24,000	24,000	24,000	24,000	24,000	24,000
Maximum Added Static	" W.C.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Coolant Sump Capacity	Gallons	16	16	16	16	16	16	16	16	16
Total System Lubrication Capacity	Gallons	30	30	30	33	33	33	33	33	33
Sound Level	dBA	80	80	80	80	80	80	80	80	80
Electric Data @ 460V-3P-60 Hz										
Full Load BHP - Package	BHP	228.25	228.25	228.25	291.5	291.5	291.5	346.5	346.5	346.5
Full Load BHP - Driver	BHP	220	220	220	275	275	275	330	330	330
Full Load BHP - Fan	BHP	8.25	8.25	8.25	16.5	16.5	16.5	16.5	16.5	16.5
Full Load Amps - Package	Amps	269.5	269.5	269.5	334.6	334.6	334.6	405.6	405.6	405.6
Drive Motor RPM	RPM	1773	1773	1773	1765	1765	1765	1780	1780	1780
Drive Motor Frame ODP	NEMA	445T	445T	445T	445T	445T	445T	447T	447T	447T
Driver Eff/Power Factor/% of Load	100%	93.1/87.5	93.1/87.5	93.1/87.5	93.5/88.3	93.5/88.3	93.5/88.3	94.4/85.2	94.4/85.2	94.4/85.2
	75%	93.3/85.6	93.3/85.6	93.3/85.6	93.5/86.3	93.5/86.3	93.5/86.3	94.5/83.9	94.5/83.9	94.5/83.9
	50%	92.5/79.5	92.5/79.5	92.5/79.5	93.3/81.5	93.3/81.5	93.3/81.5	93.6/77.9	93.6/77.9	93.6/77.9
Dimensions & Weights										
Length / Width / Height	Inches	126" x 63" x 75"			148" x 76" x 85"					
Weight	Pounds	7,020#	7,020#	7,020#	13,080#	13,080#	13,080#	13,080#	13,080#	13,080#
Discharge Air Connection	Inches	2-1/2" NPT			3" NPT					
Condensate Line Connection	Inches	1/2" NPT								

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CAGI Sheet (RS185ie-A110)

Ingersoll Rand

COMPRESSOR DATA SHEET

Federal Uniform Test Method for Certain Air Compressors Not Applicable

Rotary Compressor: Fixed Speed

	MODEL DATA - FOR COMPRESSED AIR		
1	Manufacturer: **Ingersoll Rand**		
2	Model Number: **RS185ie-A110**	Date:	**4/13/2020**
	[X] Air-cooled [ ] Water-cooled	Type:	**Screw**
	[X] Oil-injected [ ] Oil-free	# of Stages:	**2**
3*	Rated Capacity at Full Load Operating Pressure [a, *]	**1444**	acfm[a, *]
4	Full Load Operating Pressure [b]	**100**	psig[b]
5	Maximum Full Flow Operating Pressure [c]	**110**	psig[c]
6	Drive Motor Nominal Rating	**250**	hp
7	Drive Motor Nominal Efficiency	**96.2**	percent
8	Fan Motor Nominal Rating (if applicable)	**5.4**	hp
9	Fan Motor Nominal Efficiency	**89.5**	percent
10*	Total Package Input Power at Zero Flow[e]	**76.2**	kW[e]
11	Total Package Input Power at Rated Capacity and Full Load Operating Pressure[d]	**223.4**	kW[d]
12*	Package Specific Power at Rated Capacity and Full Load Operating Pressure[e]	**15.47**	kW/100 cfm[e]

* For models that are tested in the CAGI Performance Verification Program, these are the items verified by the third party program administrator
Consult CAGI website for a list of participants in the third party verification program: www.cagi.org

NOTES:
a. Measured at the discharge terminal point of the compressor package in accordance with ISO 1217, Annex C; ACFM is actual cubic feet per minute at inlet conditions.
b. The operating pressure at which the Capacity (item 3) and Electrical Consumption (item 11) were measured for this data sheet.
c. Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.
d. Total package input power at other than reported operating points will vary with control strategy.
e. Tolerance is specified in ISO 1217, Annex C, as shown in table below.

NOTE: The terms "power" and "energy" are synonymous for purposes of this document.

CAGI Compressed Air & Gas Institute Member

Volume Flow Rate at specified conditions		Volume Flow Rate	Specific Energy Consumption	No Load / Zero Flow Power
m^3 / min	ft3 / min	%	%	%
Below 0.5	Below 17.6	+/- 7	+/- 8	+/- 10%
0.5 to 1.5	17.6 to 53	+/- 6	+/- 7	
1.5 to 15	53 to 529.7	+/- 5	+/- 6	
Above 15	Above 529.7	+/- 4	+/- 5	

ROT 030.2

2019 Rev 3 This form was developed by the Compressed Air and Gas Institute for the use of its members participating in the PVP. CAGI has not independently verified the reported data.

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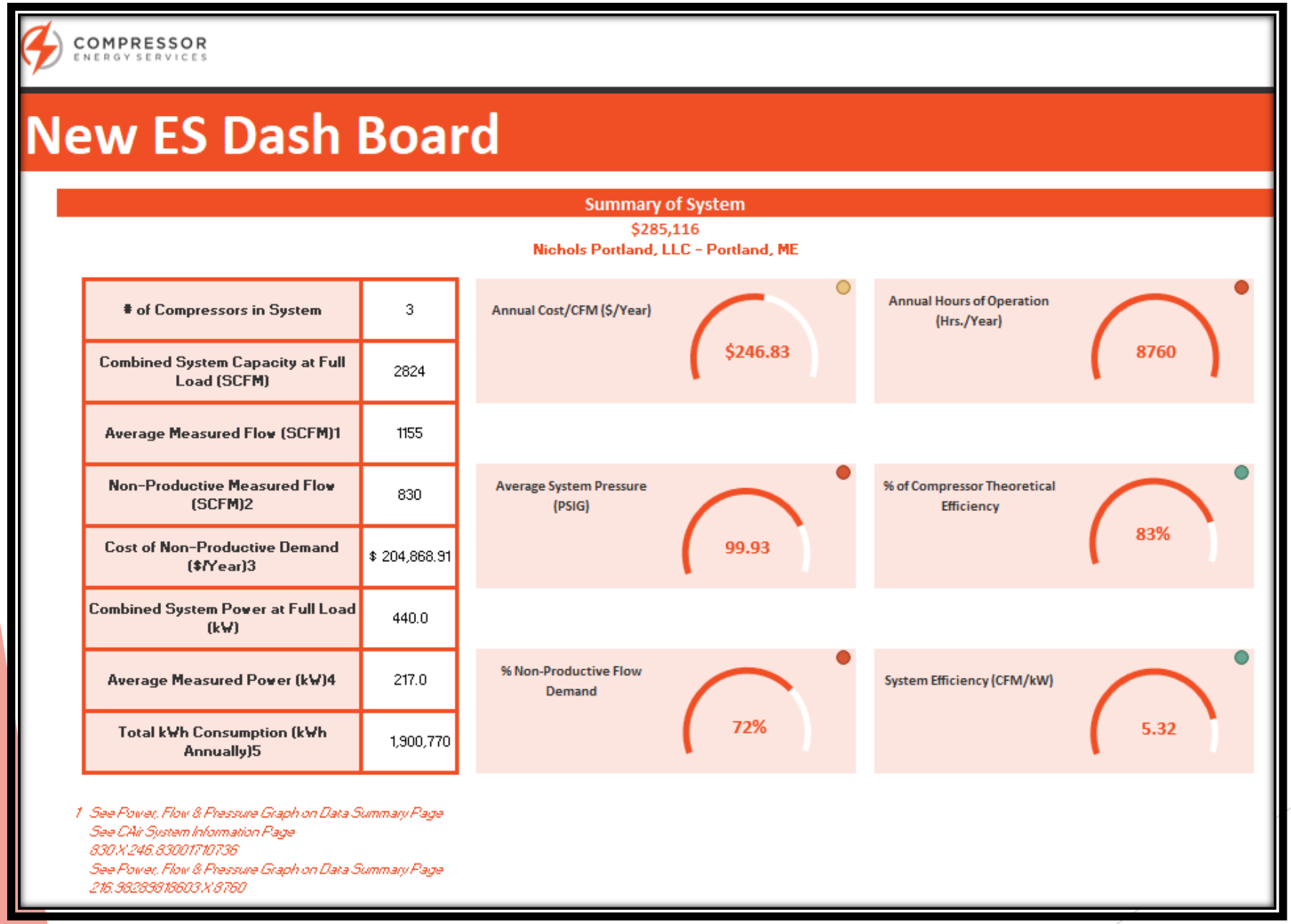
Dashboard



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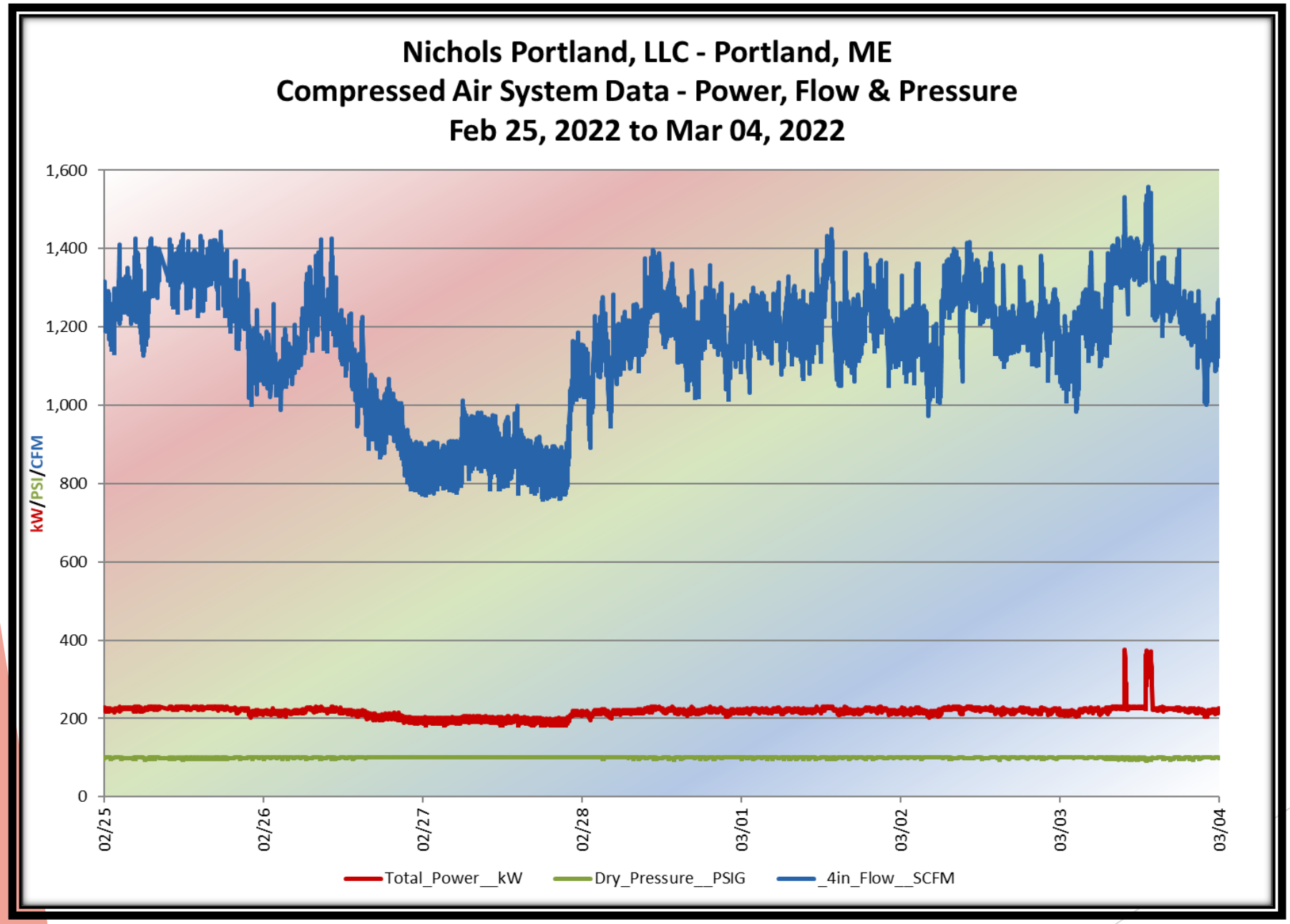
Power, Flow and Pressure



Average Power: 217kW
Average Flow: 1155 CFM
Average Pressure: 100 PSI

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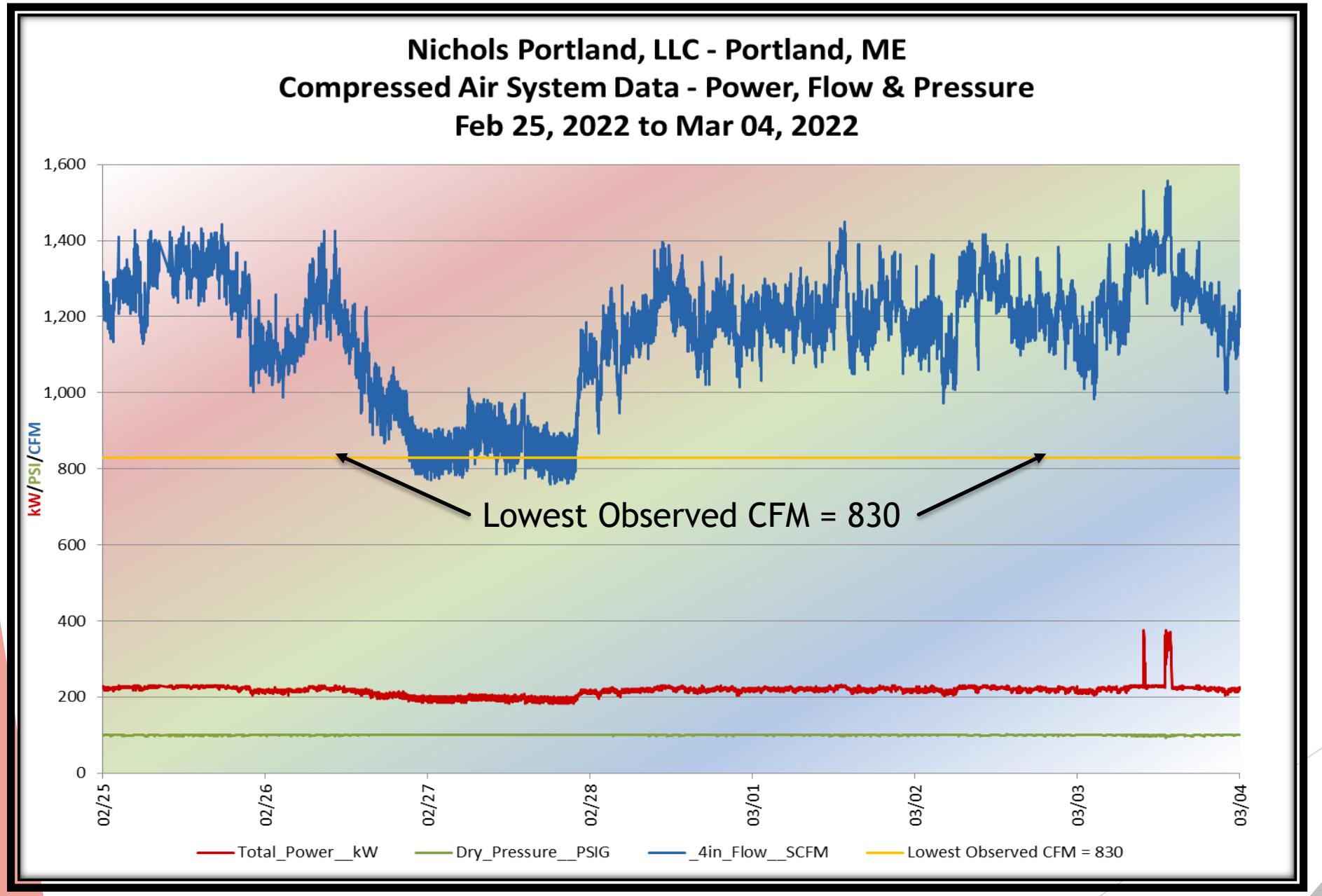
Lowest Observed Flow



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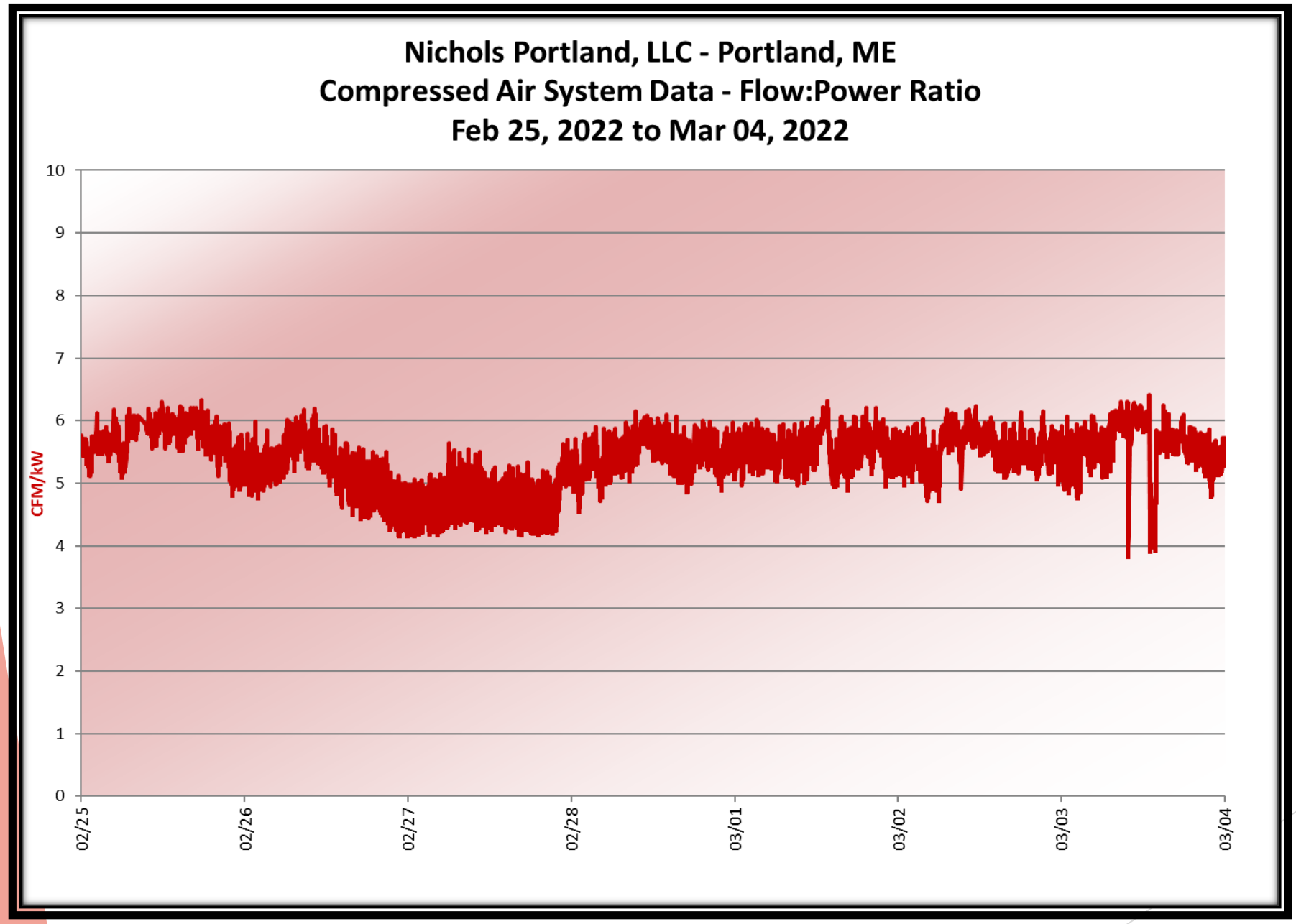
Power and Flow Ratio



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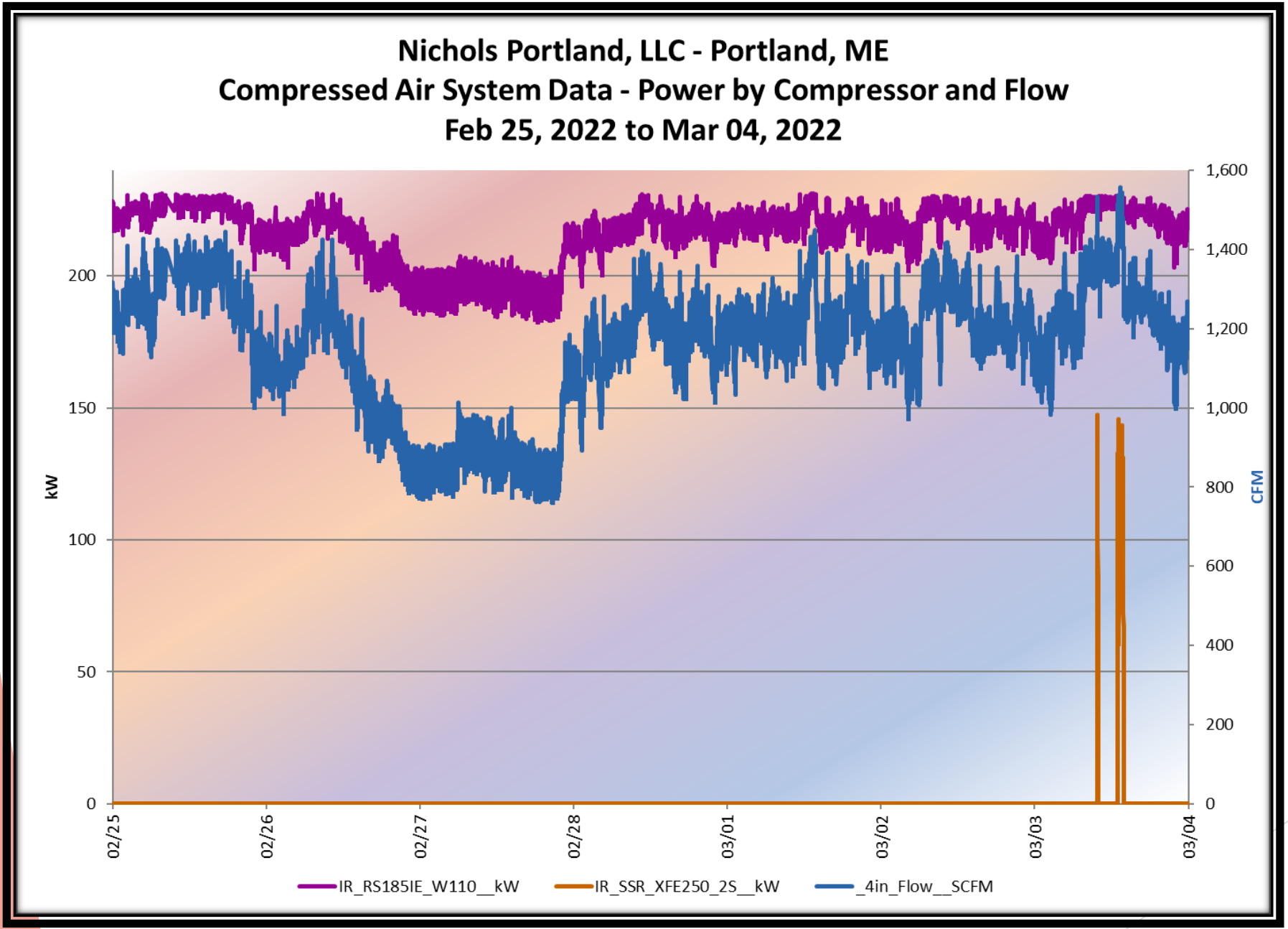
Power from Compressor and Flow



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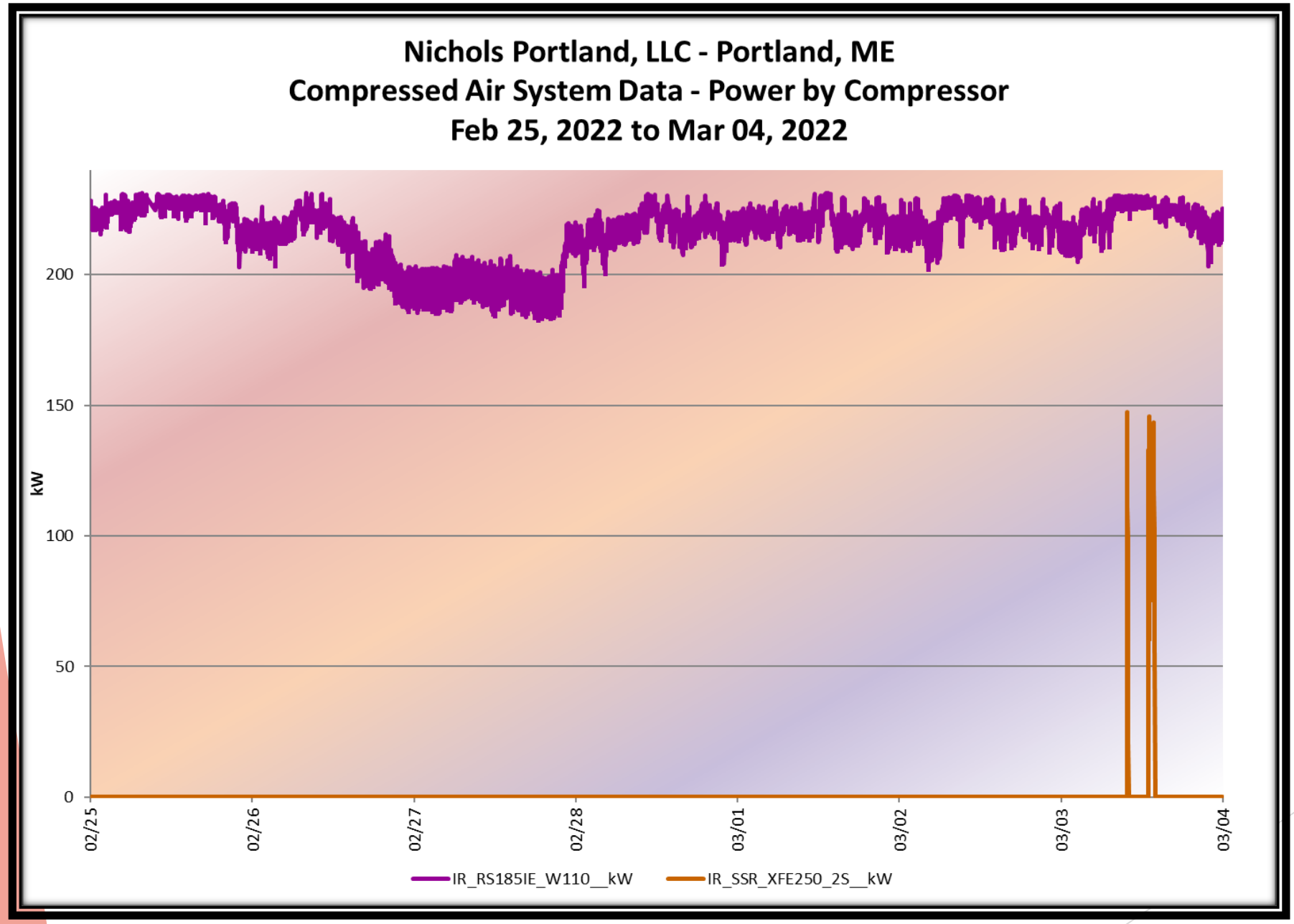
Power from Compressor



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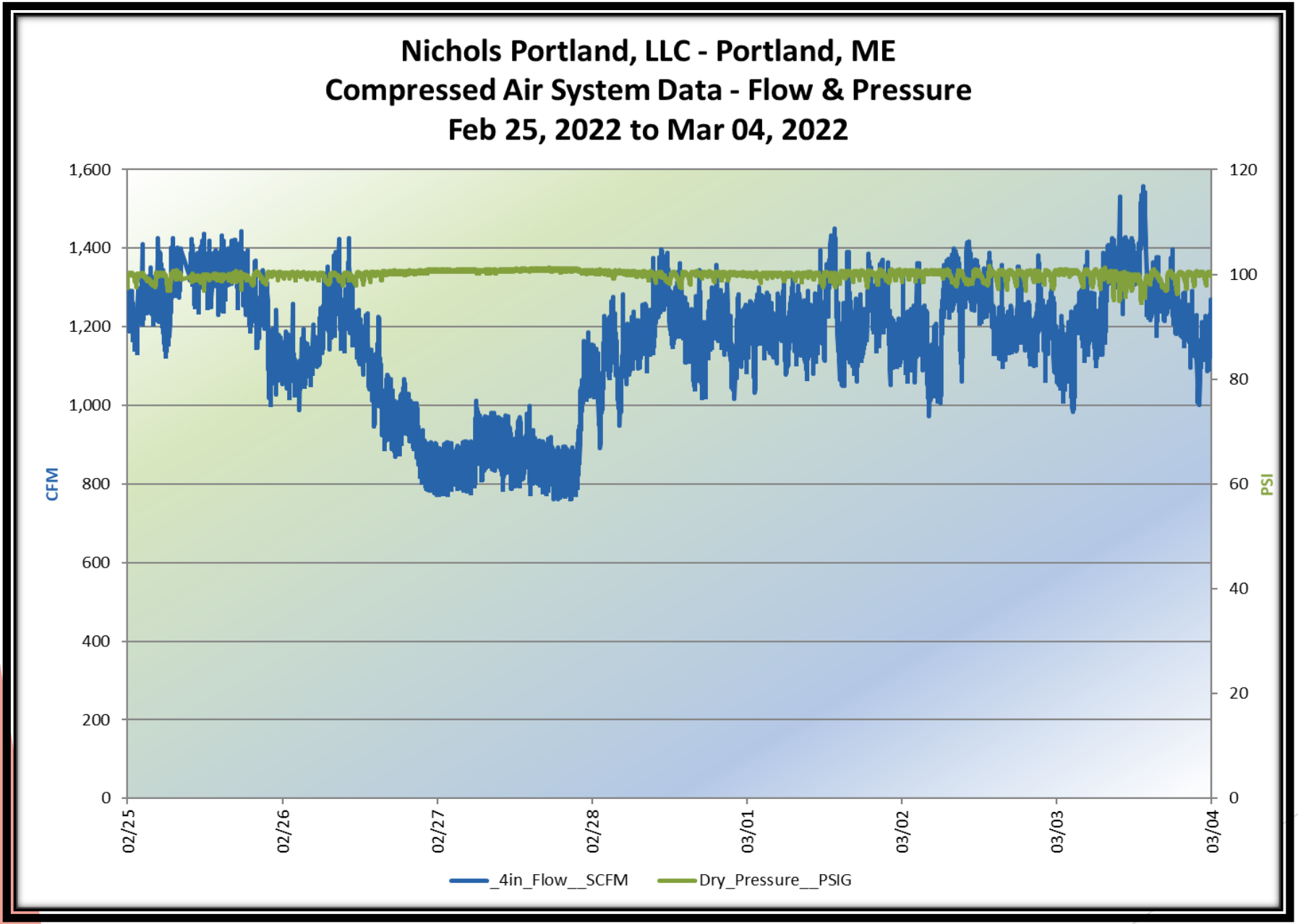
Flow and Pressure



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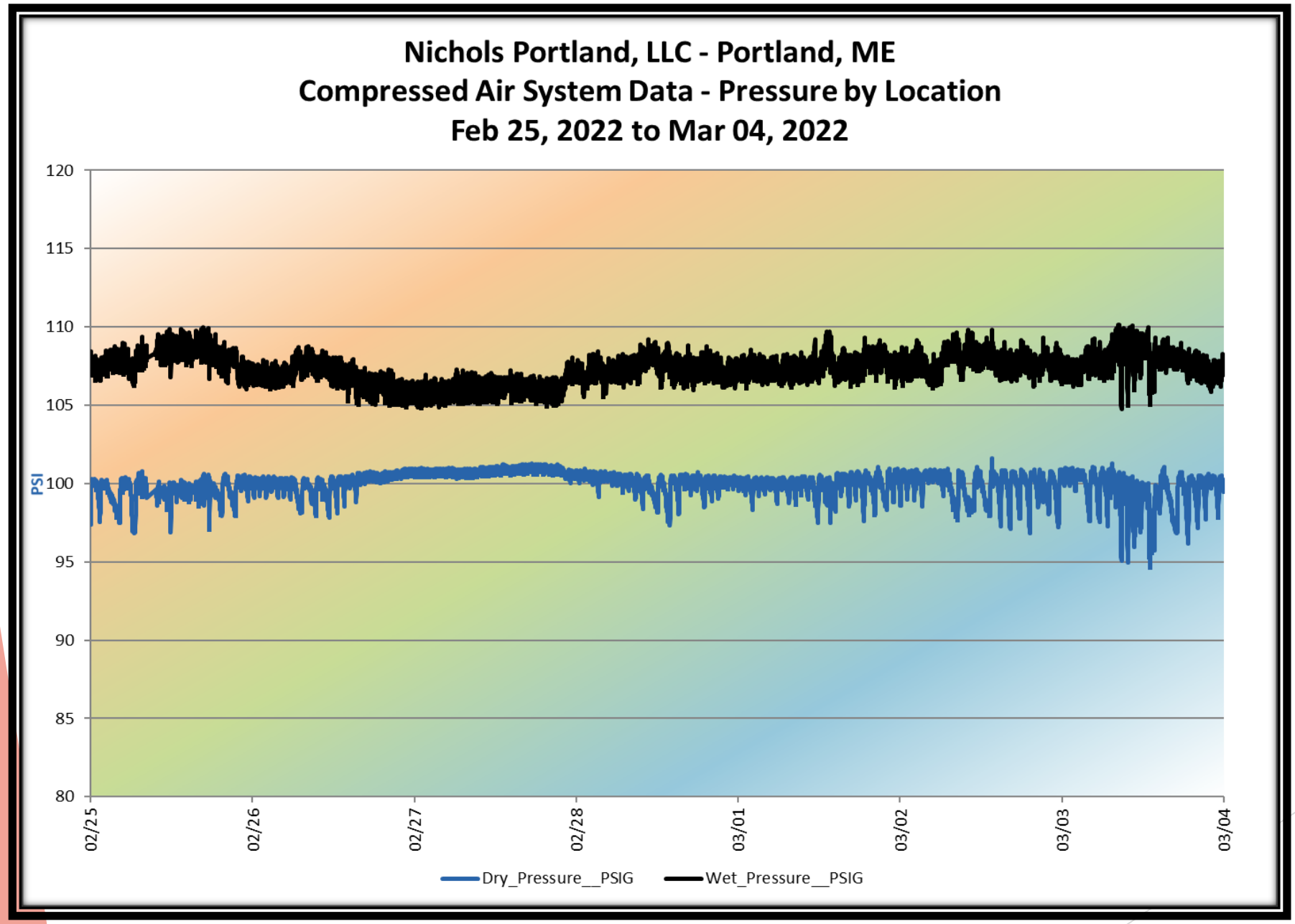
Pressure from Location



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Pressure from Location

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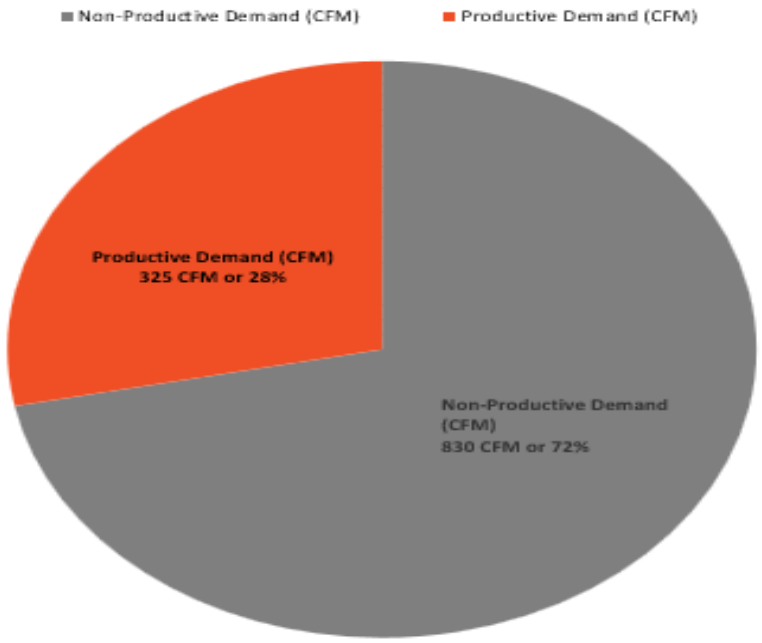
Compressed Air Demand Pie Chart

Average Measured Flow (CFM)	1155

Non-Productive Demand (CFM)	Productive Demand (CFM)
830	325

Non-Productive Demand %	Productive Demand %
72%	28%

Non-Productive VS Productive Demand



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